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ABSTRACT

Two experiments examining the "distinctiveness of encoding" hypothesis are reported. The hypothesis suggests that specific forms of processing of events may result in the formation of more exact perceptual descriptions and thus more distinctive records in memory. The two experiments reported address shortcomings in previous research on distinctiveness by comparing various forms of distinctiveness and their effectiveness in long-term recall. In one experiment, subjects were given one of four forms of data on 20 specific words: (1) the word, its definition, a word link for memorability, and the word link used in a sentence; (2) the word, definition, and the request to use the word in a sentence; (3) the word and definition; and (4) the words to be learned and their definitions, scrambled. The fourth condition was the distinctive one. After 20 minutes, a multiple-choice test was given. The first three groups performed significantly better than the fourth group. In the second experiment, the same subjects were asked to retake the earlier multiple-choice test without the earlier preparation. The same results were obtained. It is concluded that a distinctive, unfamiliar form of processing words may require additional learning time or may result in limited recall. Further research is recommended to examine the role of greater processing time, prior knowledge, and individual processing rapidity. (MSE)

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DISTINCTIVENESS OF ENCODING AND WORD LEARNING: FORMS OF "DISTINCTIVENESS" AND RETENTION OF VOCABULARY WORDS

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ABSTRACT

The "distinctiveness of encoding" paradigm which recently stemmed from the "levels of processing" perspective has been successfully employed in prose/textual materials. Two experiments were conducted to ascertain the most viable form of "distinctiveness" in word learning and to ascertain its relative effectiveness in both short and long term recall.

Since the inception of the "levels of processing" paradigm by Craik and Lockhart in 1972, this perspective has undergone several changes. Jacoby and Craik (1979) and Jacoby, Craik and Begg (1979) have offered a "distinctiveness of encoding" hypothesis. This suggests that specific forms of processing events may result in the forming of more exact perceptual descriptions and thus, more distinctive records in memory. This perspective has been examined by Glover, Plake, Roberts, Zimmer and Palmere (1981) with prose materials wherein subjects were required to paraphrase and draw inferences and were given idea unit (Meyer, 1975) recall tests. Further research by Glover, Plake and Zimmer (1982) further examined the distinctiveness notion utilizing higher order objectives stemming from Bloom's taxonomy of educational objectives (Bloom, Englehart, Furst, Hillard, Krathwohl, 1956). Later, viewing distinctiveness as decisions regarding to-be-learned materials and the difficulty of those decisions, Benton, Glover, and Bruning (1983) investigated 1) the number of decisions, 2) placement of decisions in paragraphs and concluded that recall is increased as the number of decisions increased. Benton, Glover, Monkowski and Shaughnessy (1983) further investigated the decision perspective in terms of good and poor readers, the difficulty and context of decisions and ascertained that both levels of questions and levels of difficulty directly influence recall.

Further, elaboration of processing and "spread" of processing was additionally seen (Craik and Tulving, 1975) to further memory and recall. One form of "distinctiveness" seen to be facilitative of learning was researched by Glover, Bruning and Plake (1982). Glover, et. al. utilized scrambled summary sentences which required rearranging to facilitate recall.

There have been several weaknesses in "distinctiveness" studies. First, most studies have been short-term in nature emphasizing immediate recall. Secondly, no studies have compared "distinctiveness" with other "deep processing" techniques or semantic techniques. Third, there have been no studies which utilized words and word learning; most studies have either utilized prose materials or recognition protocols.

In order to address these shortcomings, two experiments were conducted in order to ascertain 1) the effectiveness of various forms of "distinctiveness," and 2) the efficacy of these various forms in long term recall.

EXPERIMENT 1

METHOD

Subjects and setting: Subjects were 100 undergraduate volunteers enrolled in introductory psychology courses. They participated in the study for course credit. All data were collected in a large college classroom under optimal conditions.

Materials: Words taken from Funk and Tarshis (1982) were utilized as the to-be-learned materials. Four conditions were employed. The first condition gave students the word to be learned, it's definition, a word link to enhance memorability and the word link was utilized in a sentence. An example follows:

> Bibulous - readily taking up fluids or moisture; inclined to drink.
> Word Link: Bib
> The alcoholic drank so much that his friends considered putting a bib on him to keep his shirt dry.

In the second condition, the subjects were given the word to be learned, it's definition, and were then asked to use the word in a sentence. Space was provided for this. The third condition was

essentially a control group. Subjects were simply given the word and its definition. The final condition employed a "distinctive" treatment in that the definitions of the to-be-learned words were "scrambled" in a random fashion. Subjects were requested to unscramble them into a meaningful definition and to write the definition. Space was provided for this. The same twenty words were utilized in all four conditions. Twenty minutes were allowed for the learning of the words.

Procedure: At the beginning of the experimental session, students were given folders containing directions, the to-be-learned words and an IBM form for answering test questions at the end of the study period. At the end of the twenty minutes, the to-be-learned words were removed and a multiple choice test was given.

Results and Discussion: The table below shows the means and standard deviations for each of the four groups.

	Group 1	Group 2	Group 3	Group 4
$\bar{X}$	18.96	17.89	18.93	12.07
S.D.	1.48	2.18	1.26	3.41
N =	28	28	27	27

An analysis of variance was utilized which resulted in an $F(3,109) = 53.28$, p .0001.

Significant differences were observed between groups. Post hoc analysis utilizing Scheffe's test revealed that groups A, B, and C were not significantly different, but that each was superior to D. Thus, the semantic, word link and control groups performed significantly better ($p = .05$) than the "distinctive" condition.

EXPERIMENT 2

METHOD

Subjects and setting: Subjects were the same subjects used in Experiment 1. However, as some had dropped the course and others were ill, only 98 participated in the second experiment. They received course credit for their participation in this follow-up part of the experiment. The setting was the same as Experiment 1.

Materials: The same multiple choice test was employed one month after the original experiment.

Procedure: The subjects were simply asked to re-take the test that thye had taken a month earlier. An IBM form was utilized for the machine scoring of the answers.

Results and Discussion: The table below shows the means and standard deviations for each of the four groups.

	Group 1	Group 2	Group 3	Group 4
X	17.16	15.29	17.79	11.04
S.D.	3.07	3.45	2.65	3.73
M	25	24	24	25

An analysis of variance was utilized which resulted in an $F(3,97) = 20.86$, $p < .0001$.

Scheffe post hoc analysis again indicated that groups A, B, and C were not significantly different but that each was again, superior to D. Thus, the results of Experiment 1 were again replicated in Experiment 2.

General Discussion

It appears that "distinctive" processing relative to words may require additional time for learning. Traditional forms of word learning

may be associated with a lengthy past history of use and this may be more effective. Requiring students to change their processing strategies may result in frustration and limited recall. In addition, the unfamiliar processing tasks of juxtaposition may also have required additional time and may have interfered with the learning process. Further research appears necessary relative to several issues in the "distinctiveness" realm. First, additional time for processing may result in greater short-term and long-term gains. Secondly, prior knowledge of words and verbal fluency may be an aliatoric variable. Finally, rapid processors may have an advantage over slow processors. In addition, subjects' sequential and simultaneous processing skills may also be functional in word learning. In sum, the "distinctiveness" paradigm and its alternative form may be a fertile alternative to rote learning. Future research may clarify some of the aforementioned issues.

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